

CLAIMS

1. A network element, comprising:
 - a first processor supporting a first processing environment;
 - an intelligent interface between the first processing environment and a management device external to the network element, said intelligent interface comprising a second processor supporting a second processing environment independent of the first processing environment, an internal interface enabling the first processing environment to be accessed from the second processing environment, and an external interface connected to the second processing environment to enable the second processing environment to be accessed from the management device external to the network element.
2. The network element of claim 1, wherein the intelligent interface further comprises a memory.
- 15 3. The network element of claim 1, wherein the first processing environment comprises a first kernel, and wherein the second processing environment comprises a second kernel.
- 20 4. The network element of claim 1, wherein the second processor comprises control logic configured to enable a new software image to be loaded onto the intelligent interface, said new software image to be used to configure the first processing environment.
5. The network element of claim 4, wherein the intelligent interface comprises a memory, and wherein the new software image is stored in said memory.
- 25 6. The network element of claim 1, wherein the second processor comprises control logic configured to enable information related to an operational condition of the first processor to be collected over the internal interface and transmitted over the external interface.
- 30 7. The network element of claim 6, wherein the operational condition comprises at least one of Management Information Base values, logging information, and operational parameters.

8. The network element of claim 6, wherein the second processor comprises control logic configured to enable diagnostic checks to be run on the first processing environment.

9. The network element of claim 6, wherein the second processor comprises control logic
5 configured to enable modifications to be made to the first processing environment over the internal interface.

10. The network element of claim 1, wherein the external interface is configured to operate utilizing at least one of the Universal Serial Bus (USB) standards.

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11. An intelligent management interface for a network element, comprising:
an independent operating environment configured to enable the intelligent management interface to be active during a boot process of the network element; and
intelligence configured to enable the intelligent management interface to take actions on
15 the network element.

12. The intelligent management interface of claim 11, wherein the intelligence is configured to perform diagnostic checks on the network element.

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13. The intelligent management interface of claim 11, wherein the intelligence is configured to upload files to the network element.

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14. The intelligent management interface of claim 11, wherein the intelligence is configured to cause a new software image to be stored on the intelligent management interface, and to cause the network element to be restarted from the new software image.

15. The intelligent management interface of claim 11, wherein the intelligence is configured to control the network element before, during, and after a network element boot process.

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16. The intelligent management interface of claim 11, wherein the intelligence is
configured to enable at least one of files and MIB information to be transmitted from the
intelligent management interface to enable a network manager to manage the network element
during at least one of a network element boot process and in a network element run-time
environment.

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17. The intelligent management interface of claim 11, wherein the intelligence is
configured to implement a Universal Serial Bus (USB) stack to enable the intelligent
management interface to communicate over the exterior interface utilizing at least one of the
10 USB standards.

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18. A method of managing a network element, comprising:
accessing a USB port on a network element; and
transferring management information over the USB port.

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19. The method of claim 18, wherein the management information comprises a software
image to be loaded onto the network element.

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20. The method of claim 18, wherein the management information comprises
Management Information Base (MIB) values indicative of at least one of performance by the
network element and the state of operation of the network element.

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21. The method of claim 14, wherein the new software image is downloaded from a
centralized location accessible to multiple network elements, and wherein the new software
image is configured to upgrade the existing software with new software containing new features.

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22. The method of claim 14, wherein the new software image is downloaded from a
centralized location accessible to multiple network elements, and wherein the new software
image is configured to upgrade the existing software with a corrected version of the existing
30 software.